BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Subsidiary Diploma in Engineering Pearson BTEC International Level 3 Foundation Diploma in Engineering Pearson BTEC International Level 3 Diploma in Engineering Pearson BTEC International Level 3 Extended Diploma in Engineering
Unit number and title	**Unit 12: Pneumatic and Hydraulic Systems**
Learning aim(s)	**A**: Examine the safe operation and maintenance of pneumatic and hydraulic powered systems.
Assignment title	The operation of pneumatic and hydraulic systems
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You work as a trainee maintenance engineer with a small manufacturing company. The operations manager has asked you to investigate the operation, safety, maintenance requirements and effectiveness of items of pneumatic and hydraulic manufacturing machinery that have been in use for some years. Both pieces of machinery are key pieces of equipment that need to operate safely and reliably. The operations manager would like you to become familiar with them by investigating the operation of both machines and their major components including key system and component parameters. You are also asked to make recommendations for any improvements that could be made to improve safety, reliability and other key service requirements.

Task 1	You have been asked to evaluate the safe operation and maintenance of a hydraulic system and a pneumatic system in an industrial context. **To do this:** Your tutor will provide you with two case studies, one for each system. You need to: • Research the components that are used in each of the systems; and • Research the operation of the two given systems. **You then need to:** Produce an illustrated technical report that evaluates the operation, component selection, system and component parameters, safety and maintenance needs that contribute to the ability to fulfil their service requirements. Your report should include: • Information about the operation, function and interaction of each of the components within the system. This should include reference to compressors, storage

	receivers, and fluid conditioning equipment for pneumatic systems, and pump types, fluid storage methods, and fluid conditioning equipment for hydraulic systems. You should also consider the actuator and system control components that feature in each of the given systems. • An explanation of how the selection of these components effects overall system operation for the given pneumatic and hydraulic systems • An evaluation of the importance of key system parameters to overall system operation for each of the investigated systems, which takes into account the operation of pneumatic and hydraulic systems, their components in an industrial context, including methods that could be used to improve the efficiency of the safety, operation or maintenance of the systems.
Checklist of evidence required	Evidence must include: An illustrated technical report based around two contrasting case studies that include an evaluation of pneumatic and hydraulic systems and how they are used in industry. Your report should include evidence of primary research conducted by the learner for example, photographs taken during an industrial visit or notes and sketches made during an examination of a system in operation. These will be fully annotated and referenced appropriately to support the narrative of the evidence

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria you must show that you are able to:
12/A.D1	Evaluate, using language that is technically correct and of a high standard, the safe operation, maintenance requirements, component selection and key parameters necessary for a hydraulic and a pneumatic system to meet service requirements, including any improvements.
12/A.M1	Analyse the safe operation, maintenance requirements, component selection, and key parameters for a hydraulic and a pneumatic powered system, to meet service requirements.
12/A.P1	Explain the safe operation and maintenance requirements and component selection, for a hydraulic and a pneumatic powered system.

Sources of information to support you with this Assignment	**Textbooks** Esposito, A, *Fluid Power with Applications* (7th Edition), Pearson, 2014 ISBN 9781292023878 An excellent text book which supports many of the subject areas included in this unit. It also includes a chapter that introduces the use of Automation Studio computer software to simulate fluid power circuits. **Websites** bfpa.co.uk Official website for the British Fluid Power Association (BFPA) which is the UK trade body for the pneumatic and hydraulic industry. Their website has links to a range of resources available to support this unit.

	hpmag.co.uk Official website of *Hydraulics and Pneumatics: The Journal of Fluid Power and Systems* containing articles relating to industrial fluid power systems. hydraulicspneumatics.com This website provides a variety of useful resources relating to hydraulic and pneumatic technology, systems and their components **Above are some examples of websites. Further useful resources may be found at** qualifications.pearson.com/en/support/published-resources.html#step1
Other assessment materials attached to this Assignment Brief	*Case studies; one for a pneumatic system; one for a hydraulic system.*